CHAPTER 4

SOIL AND WATER CONSERVATION

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CHAPTER 4

SOIL AND WATER CONSERVATION

4000. WATER QUALITY AND QUANTITY

1. Water quality and quantity at Marine Corps Base (MCB) Quantico falls under several different federal and state regulations, as described in the sections below. Preserving the quality of water, and regulating the quantity discharged, is critical to the continued health of the Potomac River and the Chesapeake Bay, as well as to the sustained mission effectiveness at MCB Quantico.

4001. LAND USE POLLUTION ABATEMENT

1. Soil disturbing activities that have the potential for causing soil erosion and adversely affecting water quality are regulated by both State and Federal laws. The Virginia Erosion and Sediment Control Law, (Title 10.1, Chapter 5, Article 4 of the Code of Virginia) establishes compliance standards for the mitigation of soil disturbance for most land clearing/soil disturbing activities. MCB Quantico uses the NEPA process to evaluate effects of actions that could cause soil disturbance and requires planned mitigation measures for these activities, in accordance with these laws.

2. Land disturbing projects are required to be designed and constructed in accordance with the Virginia Erosion and Sediment Control Law and Regulations. The "Virginia Erosion and Sediment Control Handbook", Third Edition, 1992 is used to set minimum criteria, standards and guidelines. Erosion and sediment control concerns are addressed by requiring the designer to provide an Erosion and Sediment Control Plan. This plan is submitted to the Water Quality Program Manager, NREAB, for review and approval. Inspection and compliance verification of specific land disturbing projects is accomplished by the NREAB in coordination with the Resident Officer in Charge of Construction, Public Works Branch, or other organization responsible for the activity.

a. An erosion and sediment control plan is a document that describes the potential for erosion and sedimentation for a specific land disturbing project. The plan must explain and illustrate the measures that will be taken to control erosion and sedimentation. While it is prudent to include the erosion and sediment control standards and specifications in contract documents, the erosion and sediment control plan itself should contain notes to ensure the

controls are installed, inspected, and maintained properly. Site inspections are made regularly to ensure ongoing maintenance and effectiveness of the mitigation measures in place.

b. An erosion and sediment control plan must contain sufficient information to satisfy the plan approving authority that the problems of erosion and sedimentation have been adequately addressed for a proposed project. The length and complexity of the plan should be commensurate with the size of the project, the severity of site conditions, and the potential for off-site impacts. The greatest level of planning and detail should be evident on plans for projects that are directly adjacent to flowing streams, highly developed areas, or areas of special significance where impacts may be costly or detrimental to the environment.

c. Chapter 3 of the "Virginia Erosion and Sediment Control Handbook" contains state minimum standards and specifications for erosion control practices. Each of the minimum standards outlined in the Regulations must be satisfied in the erosion and sediment control plan. Modifications to state standard practices or innovative erosion control practices may also be employed, but must be thoroughly described to the satisfaction of NREAB.

3. For land disturbing projects greater than or equal to one acre of disturbance, the construction company must also provide a Stormwater Pollution Prevention Plan (SWPPP) for the site, and an application for a stormwater construction permit, in accordance with the Virginia Stormwater Management Regulations and Act. The plan and application, along with the required fees submitted by the contractor, are reviewed and approved by NREAB, then sent to the Virginia Department of Conservation and Recreation for permit issuance.

a. The SWPPP must outline the steps taken to ensure that storm water quality and quantity are maintained during land disturbance. The SWPPP can cite the Erosion and Sediment Control Plan to satisfy many of its requirements, but it must also address how Hazardous Material/Hazardous Waste and fuel will be stored and maintained during the project, how individuals will be trained in storm water issues, and how storm water inspections will be done.

b. In designated Resource Protection Areas (RPAs) or other areas deemed critical by NREAB, the requirement for the permit and SWPPP drops to a land disturbed area of 2,500 square feet or greater.

4. All land disturbing projects at MCB, Quantico are required to be designed and constructed in accordance with the Virginia Stormwater

Management Regulations and Act. The Virginia Storm Water Management Handbook should be used to set minimum criteria, standards and guidelines for permanent stormwater management. Stormwater Management concerns, if applicable, are addressed by requiring the project designer to provide a Stormwater Management Plan. This plan describes the specifics of permanent storm water best management practices (BMPs) for both water quality and water quantity that will be installed at the site. This plan is submitted to the Water Quality Program Manager, Natural Resources and Environmental Affairs Branch (NREAB) for review and approval.

4002. POINT SOURCE POLLUTION ABATEMENT

1. The Clean Water Act (CWA) defines a point source as "any discernable, confined and discreet conveyance, ... from which pollutants are or may be discharged" [Section 503(14)]. Point source pollution comes from industrial and sewage treatment plants, often via a discharge pipe, as well as storm sewers. The Base uses the Virginia Pollution Discharge Elimination System (VPDES) as the regulations for point and non-point source pollution abatement. The Base has five permits. Three permits, one for mainside, one for Camp Upshur, and one for pretreatment to Stafford County, are for sanitary sewage. The other two permits are concerned with stormwater and industrial pollution, which are discussed below.

2. The general stormwater and industrial permit (VA0002151) for Quantico is concerned with 18 outfalls that are sampled on a regular basis. Outfall locations are shown at Figure 4-1. What components are tested depends on what incorporates the outfall. Flow and pH are tested at all sites. Other items often tested are temperature, total suspended solids (TSS), and total petroleum hydrocarbons (TPH).

3. The municipal separate storm sewer system (MS4) permit (VAR040069) for Quantico is concerned with all aspects on Base that could influence stormwater quality and quantity. The permit is divided into six minimum control measures (MCMs): public education and outreach on stormwater impacts; public involvement/participation; illicit discharge detection and elimination; construction site stormwater runoff control; post construction stormwater management in new development and redevelopment; and pollution prevention/good housekeeping.

4. The Storm Water Pollution Prevention Plan (SWPPP) was developed in accordance with U.S. Environmental Protection Agency (EPA) regulations stating that facilities covered by a general stormwater

permit must have a SWPPP. The SWPPP identifies potential pollution sources which may be expected to affect the quality of the stormwater discharges (in relation to industrial activity) for the Base. The plan must also describe Best Management Practices (BMP's), which include operating and maintenance procedures, treatment processes, and other management practices.

5. The Stormwater Management Plan (SWMP) was developed in accordance with U.S. EPA regulations stating that facilities must develop and implement a program to address the six MCMs covered in the MS4 permit. The SWMP addresses each of these measures, as well as potential stormwater concerns, such as Total Maximum Daily Loads (TMDLs), Low Impact Development, and Watershed Management Planning.

6. Point source pollution occasionally occurs at new construction sites. This source of pollution is abated through implementation of mitigation measures prescribed in the Erosion and Sediment Control Plan and frequent inspections and close supervision of contractors and other agents who are responsible for maintaining these mitigation measures. Procedures have been established for rapid response to mitigate minor chemical and petroleum product spills as well as sewage spills.

4003. NON-POINT SOURCE POLLUTION ABATEMENT

1. Non-point source pollution comes from many sources and is caused by stormwater runoff moving through and over the ground's surface in sheet runoff, sometimes picking up harmful toxics, excess nutrients, and sediments as it travels. These pollutants are then deposited into lakes, rivers, wetlands, coastal waters, and underground water supplies. Non-point source pollution can be difficult to detect, often going completely unnoticed for years. This characteristic makes this kind of pollution hard to control.

2. The Base watersheds (Figure 4-2) supply water to four reservoirs: Smith Lake Reservoir, which supplies water to Stafford County, part of MCB Quantico and the FBI Academy; Breckinridge Reservoir, which supplies water to the Mainside area of the Base; Lunga Reservoir, which is a secondary water source for both of these reservoirs; and Lake Jackson in Prince William County. Water quality monitoring stations operated within the past 10 years are located per Figure 4-1 and are pictured in Figure 4-3. Sampling is done in conjunction with the United States Geological Survey, Water Resources Division, at stations located at the South Fork of Quantico Creek, Chopawamsic Creek, Beaverdam Run, and Little Creek. The current monitoring

includes the collection of nutrient samples, discharge measurements, sediment levels, E.coli sampling, and general water quality measurements. Sampling ensures that the Base is in compliance with the Clean Water Act, the Endangered Species Act, and the Chesapeake Bay Preservation Act requirements.

4004. DRINKING WATER SUPPLIES

1. Drinking water for the Base comes from three sources, depending upon location. Mainside water comes from Breckinridge Reservoir via the Water Treatment Facility; Camp Barrett, the FBI Academy, DEA Academy and Weapons Training Battalion (WTBn) are serviced by Stafford County, and Camp Upshur is serviced by three wells. Breckinridge Reservoir is the primary source of drinking water for the Base and Lunga Reservoir is the secondary source. Water can be pumped via underground pipe from Lunga to a tributary of Breckinridge during times of low water. Base usage has been estimated to be 20 - 30 million gallons per month, depending on the season.

4005. WETLANDS

1. The Clean Water Act (CWA) defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands are extremely productive ecosystems and sustain about 90% of the plants on the endangered species list. Many species of wildlife also prefer these lands. In addition to functioning as an important habitat for diverse species, wetlands provide an essential water management system, regulating stormwater and flood flows by absorbing excess water. Wetlands also filter water and serve as buffers against wave action and water flow to help protect shorelines from erosion.

2. Chapter 2 provides a description and hydrology map of the approximately 3,905 acres of wetlands at MCB. At the earliest conceptual stage of a land-disturbing project, wetlands must be delineated to determine the exact boundaries of wetlands on the proposed sites. Department of the Navy guidance requires that all activities avoid wetland impacts if at all possible. If impacts cannot be avoided, an Environmental Assessment must be prepared and presented to the MCB Environmental Impact Review Board to present options for minimizing and mitigating the adverse impacts. The Base consults with the U.S. Army Corps of Engineers Office (USACOE),

Dumfries, Virginia, to determine the need for permits. Some actions are allowable under Section 404, CWA, Nationwide Permits. For those actions not covered under a Nationwide Permit, A Joint Permit Application must be submitted to the USACOE. The USACOE will disseminate the application to other regulatory agencies, including the Virginia Marine Resources Commission, the Virginia Department of Environmental Quality, and local (Stafford, Prince William, or Fauquier County) wetland boards. The Virginia Water Protection Permit Program (Code of Virginia Title 62.1, Chapter 3.1 and 9 VAC 25-210-1- et seq) gives Virginia regulatory authority over activities in state waters, including wetlands, regardless of federal authority. Therefore, all wetland impacts on the Base typically require both USACOE and Virginia permits. The Resident Officer in Charge of Construction and NREA Branch will jointly ensure that applicable federal and Virginia permits have been secured prior to construction.

3. Executive Order 11990 and Department of the Navy policy requires that projects result in "no net loss" or degradation of wetlands. Where wetland loss is unavoidable, mitigation by creating or restoring at least an equal acreage of wetlands, preferably of the same type, is required. For wetland losses subject to federal and Virginia permitting, mitigation is often required at 2:1 or greater replacement ratios. Mitigation for lost wetlands must be designed, funded and incorporated into each project.

4. Prior to November 7, 2003, wetland mitigation on DoD lands needed to be accomplished onsite by constructing replacement wetlands or by creation of a wetland mitigation bank (WMB). WMB’s must be constructed prior to wetland losses, must be approved by regulatory agencies, and are designed to produce wetland credits that can be used as compensatory mitigation for future wetland losses. The construction of wetland mitigation is extremely expensive (on-site costs for forested wetland mitigation have been in excess of $200,000 per acre at MCB). The long-term costs of a wetland mitigation bank may be an expensive undertaking but may be far less expensive than mitigating on a case-by-case basis and may create more ecologically functional wetlands. MCB has explored options for the construction of a WMB but a suitable site has not been found on the Base.

5. On November 7, 2003, DoD was given authority by 10 USC 159, Section 2694b, to mitigate wetland losses by making payments to a commercial wetlands mitigation banking program or “in-lieu-fee” mitigation sponsor in accordance with Federal Guidance for the Establishment, Use and Operation of Mitigation Banks or the Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation Under Section 404 of the Clean Water Act. This mitigation

shall be in lieu of mitigating wetland impacts through the creation of wetlands on Federal property. This legislation is significant because it provides the Base options to mitigate by means other than onsite creation of wetlands. The legislation also specifies that payments made to a wetland mitigation banking program or consolidated user site may be treated as eligible project costs for military construction. Therefore, the costs of any wetlands mitigation required as a result of MIL-CON projects at MCB should be programmed as part of the MIL-CON budget for the project.

4006. FLOODPLAINS

1. Executive Order 11988 (May 24, 1977) requires Federal agencies to avoid actions that directly or indirectly affect flood plains. This Order identifies floodplains as "lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum that area subject to a one percent or greater chance of flooding in any given year." Federal agencies are to avoid direct or indirect development of floodplains and to take a leadership role in restoring and preserving the natural and beneficial values served by floodplains. MCB uses the NEPA process to evaluate the potential effects of actions proposed in floodplains.

4007. CHESAPEAKE BAY AGREEMENT

1. The Chesapeake Bay is a national treasure and a resource of worldwide significance. It is the largest estuary in the United States with a surface area of more than 2,300 square miles and a watershed that encompasses 64,000 square miles from Cooperstown, New York to the Atlantic Ocean at Virginia Beach, Virginia, as shown at Figure 4-4. In the late 1970's and early 1980's the Chesapeake Bay Program instituted an intensive research project to determine the causes of the degradation in the Chesapeake Bay water quality as well as to the fish, shellfish and other living resources and their habitat.

2. The purpose of the Chesapeake Bay Preservation Act (CBPA) is to "protect and improve the water quality of the Chesapeake Bay, its tributaries, and other state waters by minimizing the effects of human activity upon these waters and implementing the Act, which provides for the definition and protection of certain lands called Chesapeake Bay Preservation Areas, which if improperly used or

developed may result in substantial damage to the water quality of the Chesapeake Bay and its tributaries."

3. The Chesapeake Bay Program (CBP) is a partnership between the states and federal agencies located in the Chesapeake Bay watershed that was formed to restore and manage the bay. Total Federal holdings in the watershed are in excess of 1.5 million acres. Regulations under the Chesapeake Bay Agreement include designation of Resource Protection Areas (RPA) and Resource Management Areas (RMA). RPA consist of sensitive lands at or near the shoreline, to include a buffer area of not less than 100 feet in width located adjacent to and landward of: tidal wetlands; nontidal wetlands connected by surface flow to tidal wetlands or tributary streams; and tidal shores and other lands necessary to protect the quality of state waters. RMA are provided contiguous to the entire inland boundary of the RPA and consider for inclusion floodplains, highly erodible and highly permeable soils, steep slopes, and nontidal wetlands not included in the RPA. RMA shall encompass a land area large enough to provide significant water quality protection. The federal government adopted a policy to favor the creation of forested buffers along streams in order to help achieve both nutrient reduction and habitat restoration goals in support of the Chesapeake Bay Program. The Department of Defense is a signatory to an agreement supporting the CBPA and partnering to conduct restoration of the Bay. The Marine Corps has adopted the policies and best management practices set forth in the CBPA and its associated regulations and will comply to the maximum extent possible consistent with the military mission and budget constraints. Silvicultural activities are exempt from these regulations provided they adhere to the Department of Forestry's "Best Management Practices." Nutrient Management Plans were prepared for grassland fertilization programs conducted by the MCB Golf Course and the Fish, Wildlife and Agronomy Section.

4008. COASTAL ZONE MANAGEMENT

1. The Coastal Zone Management Act (15 CFR 923.84) requires that, to the extent practicable, Federal actions affecting any land/water use, or coastal zone natural resource, be implemented consistent with the enforceable policies of an approved state management program. The Act authorizes states to administer approved coastal nonpoint pollution programs. Advance concurrence from the Virginia Coastal Resources Management Program, Virginia Department of Environmental Quality, is required prior to taking an action affecting the use of subaqueous lands, water, or natural resources of the coastal zone.

Excluded from the coastal zone are lands solely subject to or held in trust by the federal government, its officers, or its agencies.

2. MCB Quantico will support the development and implementation of state coastal nonpoint pollution control programs on Marine Corps lands by identifying nonpoint sources, specifying corrective measures, and coordinating nonpoint source compliance efforts with state programs. MCB Quantico will identify areas of sensitive natural resources of the coastal zone, minimize the loss or degradation of coastal wetlands, and protect water quality.

4009. FORESTRY BEST MANAGEMENT PRACTICES (BMPs) FOR WATER QUALITY

1. Forest management activities are exempted from the Virginia Erosion and Sediment Control Law because they are usually less severe and require different and unique mitigations. They are governed by BMPs established through the Virginia Department of Forestry. These BMPs are practices that are implemented to reduce erosion and prevent or control water pollution resulting from forestry operations. They were designed to achieve the following major goals:

a. Minimize surface runoff waters originating from any type of forestry related soil disturbance.

b. Maintain the integrity of all stream beds and banks.

c. Prevent deposition of logging debris in stream beds.

d. Prevent chemicals, pesticides, fertilizers or petroleum products from entering or degrading (directly or indirectly) streams, ground water or surface water.

e. Establish streamside management zones (SMZs) along perennial water courses that filter sediment from overland flow and maintain stream temperature.

f. Provide rapid revegetation of all exposed mineral soil areas through natural processes supplemented by artificial revegetation where necessary.

2. Virginia BMPs do not constitute a law, but are voluntary compliance regulations. In July of 1993, VDOF was given the responsibility to inspect harvesting operations for water quality degradation. Through this legislation, the Department has the

authority to recommend corrective action, stop harvesting operations, and initiate civil penalties up to $5,000 per day.

3. The major Federal law governing the protection of wetlands and water quality is the Clean Water Act (CWA). Normal silvicultural (forest management) activities which may involve earth-moving are exempt from regulation under Section 404 of the CWA. Normal practices covered by this exemption include planting, seeding, cultivating, minor drainage and harvesting. Minor drainage is connecting upland drainage facilities to a stream or water body. The silvicultural exemption does not include land-disturbing activities such as grading, leveling, filling in low spots or converting to upland. Any activity that converts a wetland into a non-wetland is not exempt. Conversion into a new use, such as clearing forested wetlands for pasture, crop land or development is also not exempt and requires a Section 404 permit (VDOF 1997). Maintenance of existing drainage ditches, structures and fill is exempt from Federal regulation provided there is no modification of the original design. Construction and maintenance of forest roads are exempt if the work is done in accordance with State approved BMPs (VDOF 1997).

4. Forest management actions at MCB, Quantico will reflect full compliance with the above stated regulations in order to ensure the protection of wetlands and the maintenance of water quality.

4010. MILITARY MUNITIONS RESPONSE PROGRAM

1. The Department of Defense (DoD) launched the Military Munitions Response Program (MMRP) in order to respond to safety and environmental hazards related to the presence of munitions and explosive constituents of concern (MEC) on military properties other than active ranges. In accordance with the Department of the Navy (DON) Munitions Response Program, Marine Corps Headquarters has been tasked with identifying closed range areas on each Marine Corps base. Range activities at MCB Quantico consist of the training of members of the armed forces in the use and handling of military munitions, other ordnance and weapons systems. Areas on MCB Quantico that have land uses that are incompatible with these range activities would be recommended for closure.

2. The DON Munitions Response Program is a centrally funded program managed by the Naval Facilities Engineering Command (NAVFAC) Washington for MCB Quantico. Funding for the MMRP is provided by Headquarters Marine Corps as Environmental Restoration, Navy (ERN)

funds. Site investigations are scheduled to commence in 2006 and be completed in 2007. Site remediation would commence in 2009.

3. The primary impact on MCB Quantico will be implementation of land use controls on closed ranges. This is necessitated by limitations of the detection technologies. Land use controls will be implemented based on actual or expected hazards that may remain after completion of removal actions. Additional surveying for munitions may be required when performing any tasks involving excavation, such as construction or utility improvements, on a closed range.

4011. WORK PLAN. A list of projects, budget estimates and time lines for soil and water conservation programs is provided at Table 4-1.

Table 4-1. List of projects, budget and time line for soil and water conservation programs. Priority (PRTY) "A" projects maintain the existing program. Priority "B" and "C" projects add additional projects to provide a more comprehensive program. [1]Funding sources are indicated in ().

DRIVER, GOAL, PROJECT	PRTY	Estimated annual cost in $1,000 increments				
DRIVER I. TO PRESERVE, DEVELOP & MANAGE LAND & WATER RESOURCES		2007	2008	2009	2010	2011
1. Goal: To comply with Clean Water Act and Chesapeake Bay preservation initiatives by identifying, monitoring and mitigating actions that cause land disturbance and/or release of pollutants.						
• Collect water quality data from South Fork Quantico Creek per DOI watershed agreement. (FEFV)	A	67	69	71	73	75
• Collect water quality data from other on-base streams to monitor pollutant loads in keeping with Chesapeake Bay preservation initiatives. (FEFV)	A	100	100	100	100	100
• Collect water quality data from permitted outfalls to monitor pollutant loads in accordance with VPDES Permit #VA0002151 (FEFX)	A	50	50	50	50	50
• Monitor construction projects to ensure that Virginia erosion and sediment control regulations are being implemented and provide guidance for personnel responsible for mitigation measures. (FEFV)	A	*	*	*	*	*
• Mitigate wetlands losses through site-specific projects to create wetlands or by purchase of credits from a wetlands mitigation bank.	A	[2]0	0	0	0	0
• Install 250 meters of vegetated shoreline buffers or engineer-designed structure to protect shorelines and riparian areas. (FEFV)	B	0	0	50	250	0

Table 4-1. List of projects, budget and time line for soil and water conservation programs. Priority (PRTY) "A" projects maintain the existing program. Priority "B" and "C" projects add additional projects to provide a more comprehensive program. [1]Funding sources are indicated in ().

DRIVER, GOAL, PROJECT	PRTY	Estimated annual cost in $1,000 increments				
DRIVER I. (continued)		2007	2008	2009	2010	2011
• Patrol and enforce ORV restrictions, especially in the Chopawamsic Creek watershed near Breckinridge Dam. Repair/block access to unauthorized ORV trails. (FEFV)	B	25	*	*	*	*
• Increase shoreline/riparian protection measures to 500 meters. (FEFV)	C	0	0	50	250	0
• Measure sedimentation depth in Lunga and Breckinridge Reservoirs to evaluate dredging needs or potable water impacts. (FEFV)	C	0	0	0	0	125
DRIVER IV. TO IDENTIFY AND EVALUATE SOURCES OF ENVIRONMENTAL POLLUTION AND INCORPORATE MITIGATION MEASURES FOR RESTORATION OF AFFECTED NATURAL RESOURCES						
1. Goal: To evaluate and coordinate the installation of preventive methods to reduce and/or eliminate the potential release of pollutants that would be hazardous to the environment by impacting the soil, water or air.						
• Update and maintain the Combined Spill Plan and conduct preparedness for Response Exercise Program training as an integral part of the Spill Prevention and Control Program. (FEFY)	A	25	25	25	25	25
• Coordinate reduction of hazardous waste volume and toxicity by exercising pollution prevention measures and by updating the Pollution Prevention (P2) Plan. (FEFY)	A	50	25	25	25	25
• NREA and Base Safety to develop regulation concerning the acquisition and transport of hazardous materials at MCB.	B	0	*	0	0	0

Table 4-1. List of projects, budget and time line for soil and water conservation programs. Priority (PRTY) "A" projects maintain the existing program. Priority "B" and "C" projects add additional projects to provide a more comprehensive program. [1]Funding sources are indicated in ().

DRIVER, GOAL, PROJECT	PRTY	Estimated annual cost in $1,000 increments				
• DRIVER IV. (continued)		2007	2008	2009	2010	2011
• Develop proactive approach in preventive maintenance of drainage systems through inspection, labeling of drains and an instructional awareness program. (FEFX)	B	20	40	20	20	20
• Improve response time to spills by Base personnel and private contractors. (FEFX)	B	45	45	45	45	45
• Inspect and maintain permanent storm water best management practices (BMPs) to ensure proper water quality and quantity control (FEFX).	B	10	15	15	20	20
• Develop educational materials and programs to ensure public education and awareness of storm water issues is addressed (FEFX)	B	10	10	10	10	10
• Complete detailed survey of the storm, industrial and sanitary sewer systems west of I-95 to determine whether there are illicit connections, cross-connections or other improper discharges into the systems. (FEFX)	C	0	50	0	50	0
• Maximize reduction of the spill response time by acquiring additional air and skimmer boats and recovery booms with supportive equipment and trained personnel. (FEFX)	C	0	0	60	0	0
• Include implementation of the Hazardous Materials Pharmacy Program with the established itemized procedural method for reduction of waste volume and toxicity. (FEFY)	C	150	100	100	100	100

Table 4-1. List of projects, budget and time line for soil and water conservation programs. Priority (PRTY) "A" projects maintain the existing program. Priority "B" and "C" projects add additional projects to provide a more comprehensive program. [1]Funding sources are indicated in ().

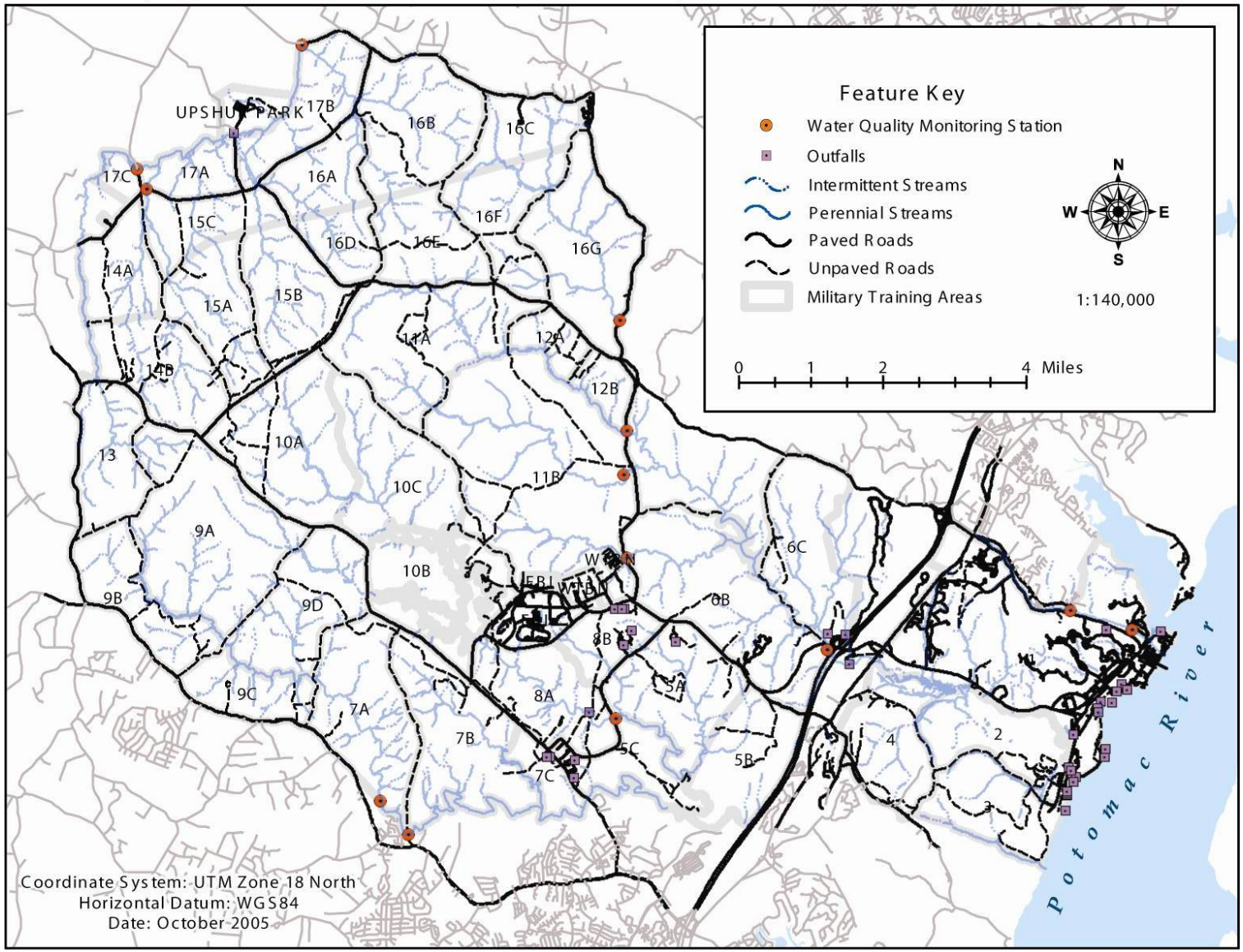
DRIVER, GOAL, PROJECT	PRTY	Estimated annual cost in $1,000 increments				
DRIVER IV. (continued)		2007	2008	2009	2010	2011
2. Goal: To comply with Clean Air Act (CCA), Comprehensive Environmental Response Compensation and Liability Act (CERCLA) / Installation Restoration Program (IRP), Resource Conservation and Recovery Act (RCRA), and Department of the Navy orders regarding the Military Munitions Response Program (MMRP) to survey, identify, record, report and remediate sources of contamination						
• Coordinate, implement, and complete required action for the closure and post closure care of RCRA sites at landfills and C-Demo. (FEFX)	A	150	150	150	150	150
• Remedy in place on IR Sites (ERN)	A	2500	5600	5100	800	800
• Complete Military Munitions Response Program (MMRP) Site Investigations (SI) using funds expended in FY 2006	A					
• Complete 3 MMRP Remedial Investigations per year (HQMC)	A			1000	1000	1000
• Maintain the implementation of the petroleum above and underground storage tank management programs through continuous update of the Petroleum Storage Tank Management Plan and recurring training. (FEFX).	A	15	15	15	15	15
• Coordinate, implement, and maintain the ongoing air emissions inventory, monitoring and reporting program for all regulated sources. (FEFX)	A	50	50	50	50	50
• Implement a refrigerant service and accountability tracking program for all refrigeration, air-cooling and automotive air condi-tioning equipment.(FEFX)	A	25	25	25	25	25

Table 4-1. List of projects, budget and time line for soil and water conservation programs. Priority (PRTY) "A" projects maintain the existing program. Priority "B" and "C" projects add additional projects to provide a more comprehensive program. [1]Funding sources are indicated in ().

DRIVER, GOAL, PROJECT	PRTY	Estimated annual cost in $1,000 increments				
DRIVER IV. (continued)		2007	2008	2009	2010	2011
• Include a petroleum tank maintenance program that mandates the identification of deficiencies and corrective actions; the upkeep of tank appurtenances and peripherals; tank operator/owner training; and other actions that conform to prevailing tank regulations. (FEFX)	A	130	50	65	50	50
• Implement a multifaceted water conservation program with emphasis on the use of water in industrial processes; the reduction of the generation of wastewater flows; and the operation and maintenance of equipment and devices installed on the waste distribution systems. (FEFY)	B	25	25	25	25	25
• Implement the use of sewage holding tanks or septic systems at recreational and training areas where sanitary sewer systems are unavailable. (FEFX)	C	50	50	50	50	50
[3]Subtotal for "A" projects		**3162**	**6159**	**6676**	**2363**	**2365**
Subtotal for "B" projects		**135**	**135**	**165**	**370**	**120**
Subtotal for "C" projects		**200**	**200**	**260**	**450**	**275**
Grand Total		**3497**	**6494**	**7101**	**3183**	**2760**

[1]Primary funding sources include: Fund Administrator FEFV (conservation), FEFX (compliance), FEFY (pollution prevention), ERN (Environmental Restoration Navy), and HQMC funds.
[2]Wetlands mitigation should be funded by the project that causes the unavoidable impact (usually construction funds).
*Project costs are primarily labor related.
[3]Costs for different funding sources are itemized in Table 10-1.

Marine Corps Base Quantico: Outfalls & Water Quality Monitoring Stations



Quantico MCB: Watershed Areas

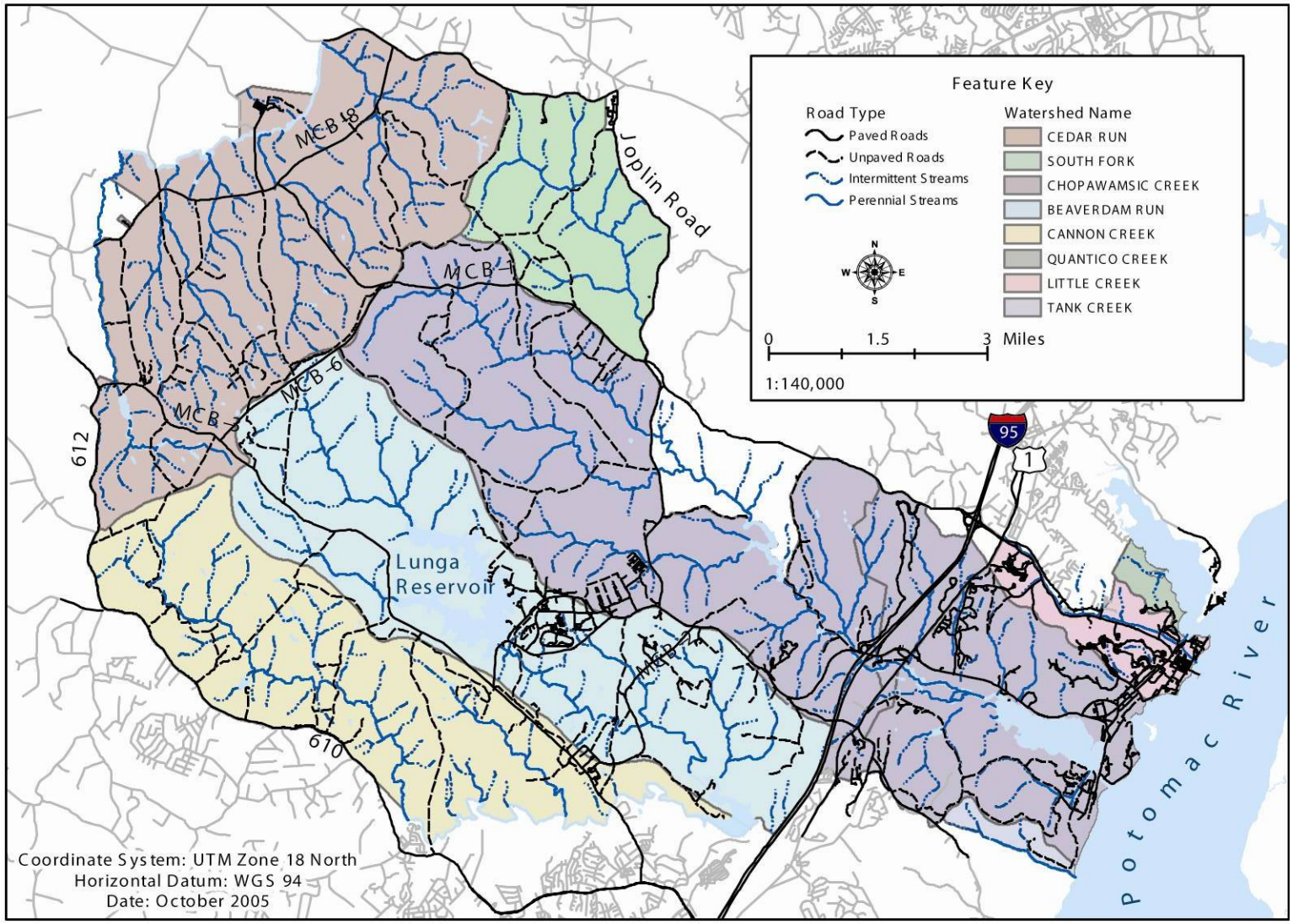


Figure 4-3.--Water Sampling Station (top) and tidal wetlands (bottom).

Figure 4-4.--Chesapeake Bay Watershed